

2010 Montana Barley Crop Quality Report

Introduction

This is the first Regional Crop Quality Report for malt barley grown in Montana. A total of 113 barley samples were collected at farms and elevators during the 2010 barley harvest and analyzed for the purpose of this report. Sample collection was coordinated by the U.S.

Department of Agriculture (USDA), North Dakota and Montana Agriculture Statistics Services in Fargo, N.D. and Helena, MT. Grain quality evaluations were performed by the Department of Plant Sciences at North Dakota State University, grades were determined by the

Figure 1. Barley Production Regions in Montana

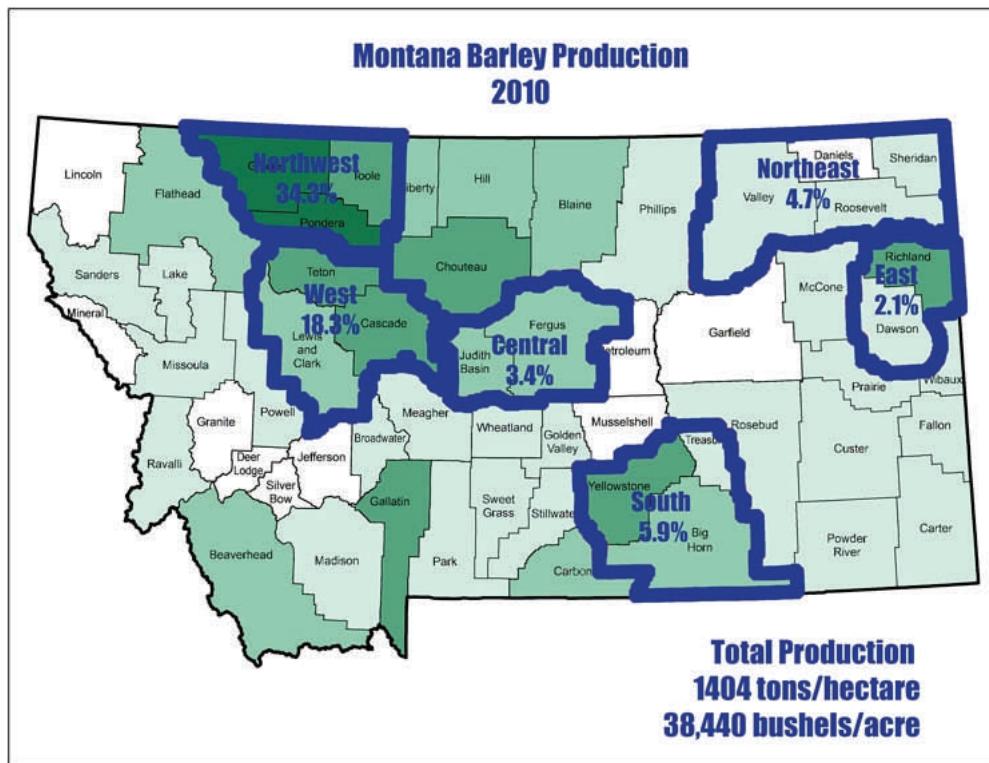


Table 1. Barley Production Regions in Montana

Region	Production	Counties
Northwest	2-rowed dryland	Glacier, Toole, Pondera
West	2-rowed, dryland and irrigated	Teton, Cascade, Lewis and Clark
Central	2-rowed, dryland and irrigated	Judith Basin, Fergus
Northeast	6-rowed, dryland	Valley, Roosevelt, Sheridan, Daniels
East	6-rowed, irrigated	Richland, Dawson
South	2-rowed, dryland and irrigated	Yellowstone, Treasure, Big Horn

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North Dakota Grain Inspection Service Inc, Fargo, N.D. and the Montana Wheat and Barley Committee, Great Falls, MT provided financial support.

Weather, Growing Season and Harvest

Field work began early in most parts of Montana. Twenty-one percent of producers were able to start field work in early April compared to 6 percent in 2009. By April 25, 52 percent of the barley crop had been planted, far ahead of the 19 percent planted by this date in 2009 and the five year average of 34 percent. Increased precipitation and cooler temperatures in late April and early May slowed field work but by the end of May, with 94 percent of the barley crop planted, 81 percent was reported to be in good to excellent condition.

Early June was wet and cold, slowing crop progress, with 54 percent of the crop reaching boot stage on June 28, as compared to the five year average of 66 percent.

Adequate to excess moisture far above the five year average levels was seen through July, August, September and through the end of October when 78 percent of topsoil was rated as having adequate to surplus moisture, as compared to 64 percent in 2009, and a five year average of 65 percent.

Because of extremely wet conditions during the harvest season, and time and salary constraints of USDA-NASS enumerators, sample collection was not complete at the final collection deadline. Sampling was completed on October 12, 2010 at which time USDA-NASS reported that 91 percent of the Montana barley crop had been harvested. A week later, on October 17, the harvest was still only 95 percent complete, with barley remaining in the fields in portions of Glacier County.

Table 2. Grade and Grade Requirements for Barley

Grade	Minimum limits of -		Maximum limits of -					
			Heat					
	Test Weight (lb/bu)	(kg/hl)	Sound Barley*	Damaged Kernels*	Damaged Kernels	Foreign Material	Broken Kernels (%)	Thin Barley (%)**
U.S. No. 1	47.0	60.5	97.0	2.0	0.2	1.0	4.0	10.0
U.S. No. 2	45.0	57.9	94.0	3.0	0.3	2.0	8.0	15.0
U.S. No. 3	43.0	55.3	90.0	4.0	0.5	3.0	12.0	25.0
U.S. No. 4	40.0	51.5	85.0	8.0	1.0	4.0	18.0	35.0
U.S. No. 5	36.0	46.3	75.0	10.0	3.0	5.0	28.0	75.0

U.S. Sample grade:

U.S. Sample grade shall be barley that:

- a)Does not meet the requirements for the grades U.S. Nos. 1,2,3,4 or 5; or
- b)Contains 8 or more stones or any number of stones which have a aggregate weight in excess of 0.2 percent of the sample weight, 2 or more pieces of glass, 3 or more *crotalaria* seeds (*Crotalaria* spp.), 2 or more castor beans (*Ricinus communis* L.), 4 or more particles of unknown foreign substance(s) or a commonly recognized harmful or toxic substance(s), 8 or more cocklebur (*Xanthium* spp.) or similar seeds singly or in combination, 10 or more rodent pellets, bird droppings, or equivalent quality or other animal filth per 1-1/8 to 1-1/4 quarts of barley; or
- c)Has a musty, sour, or commercially objectionable foreign odor (except smut or garlic odor); or
- d)Is heating or otherwise of distinctly low quality

*Includes heat-damaged kernels. Injured-by-frost kernels and injured-by-mold kernels are not considered damaged kernels.

**Use the 5/64 x 3/34 slotted hole sieve.

Information from: United States Department of Agriculture, Grain Inspection, Packers and Stockyards Administration, Federal Grain Inspection Service, Grain Inspection Handbook II, August 9, 2004

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Table 3. Grade and Grade Requirements for Two-Rowed Malting Barley

Grade	Minimum limits of -		Maximum limits of -				
	Test Weight (lb/bu)	(kg/hl)	Sound Barley* (%)	Wild Oats (%)	Foreign Material (%)	Skinned and Broken Kernels (%)	Thin Barley (%)**
U.S. No. 1	50.0	64.4	97.0	1.0	0.5	5.0	5.0
U.S. No. 2	48.0	61.8	97.0	1.0	1.0	7.0	7.0
U.S. No. 3	48.0	61.8	95.0	2.0	2.0	10.0	10.0
U.S. No. 4	48.0	61.8	95.0	3.0	3.0	10.0	10.0

*Injured-by-frost kernels and injured -by-mold kernels are not considered damaged kernels or considered against sound barley.

**Use 5.5/64 x 3/4 slotted-hole sieve.

Notes:

Malting barley shall not be infested, blighted, ergoty, garlicky, smutty, or contain any special grades. Upon request, malting barley varieties may be inspected and graded in accordance with standards established for the class Barley.

Two-rowed Malting barley that does not meet the requirements for U.S. Nos. 1,2,3, or 4 Malting shall be graded under the Barley standards.

Information from United States of Agriculture Grain Inspection, Packers and Stockyard Administration Federal Grain Inspection Service Grain Inspection Handbook, Book II, Barley, August 9, 2004

Table 4. Grade and Grade Requirements for Six-Rowed Malting Barley

Grade	Minimum limits of -			Maximum limits of -					
	Test Weight (lb/bu) (kg/hl)		Suitable Malting Type (%)	Sound Barley* (%)	Damaged Kernels* (%)	Foreign Material (%)	Other Grains (%)	Skinned and Broken Kernels (%)	Thin Barley (%)
U.S. No. 1	47.0	60.5	95.0	97.0	2.0	0.5	2.0	4.0	7.0
U.S. No. 2	45.0	57.9	95.0	94.0	3.0	1.0	3.0	6.0	10.0
U.S. No. 3	43.0	55.3	95.0	90.0	4.0	2.0	5.0	8.0	15.0
U.S. No. 4	43.0	55.3	95.0	87.0	5.0	3.0	5.0	10.0	15.0

*Injured-by-frost kernels and injured -by-mold kernels are not considered damaged kernels or considered against sound barley.

Information from United States of Agriculture Grain Inspection, Packers and Stockyard Administration Federal Grain Inspection Service Grain Inspection Handbook, Book II, Barley, August 9, 2004

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Production and Varieties

Montana barley production totaled 39 million bushels (858 thousand metric tons) from 620 thousand harvested acres (251.1 thousand Hectares), an acreage decrease of 14 percent and a 5 percent production decrease from 2009. Quality was very good with little to no DON levels recorded. Approximately 79 percent of Montana's 2-rowed barley samples were graded as USDA/FGIS grade # 1. All 6-rowed barley samples received a Grade # 1 rating. The top 2-rowed malting varieties in Montana, according to USDA/National Statistics Service, were AC Metcalfe, Harrington, Hockett and Conrad. Top forage and feed varieties were Haybet, Hays, Haxby and Baronesse.

Materials and Methods

Samples weighing from 1 to 2 pounds each were collected during harvest from selected counties in Montana. Samples were collected from farms and country elevators. The objective was to collect a representative number of samples from each selected county within the survey region. This number was determined from the projected barley production for each county. Two- and six-rowed samples were differentiated based upon varietal identification by the grower or kernel morphology. The survey region includes a total of five crop reporting districts.

One hundred and two two-rowed barley samples were collected from all five districts. Eight six-rowed samples were collected from two districts. The total number of six - and two-rowed samples collected within each county is shown in Appendix 1. Non-malt varieties were eliminated from the data analysis although quality tests were run on all 113 samples.

Upon receipt, the initial barley moisture content was recorded and samples in excess of 13.5 percent were allowed to air-dry prior to subsequent analyses. A small portion (50 grams) of each sample was removed and bulked according to district. These district composite samples were submitted to the North Dakota Grain Inspection Service Inc. for determination of grade. Dockage content was determined on each district

composite sample. Prior to further analysis, all samples collected were cleaned on a Carter dockage tester. Test weight, protein, kernel assortment, 1,000 kernel weight and kernel color were determined for each of the dockage-free samples. The values for district, state and regional averages represent the average of all individual sample results within their respective area. Separate district, state and regional averages were calculated for two- and six-rowed barley.

Crop Quality

Data from selected counties was grouped according to row type and irrigated or dryland production (Table 1).

Northwest Region

2-rowed dryland and irrigated production, had the highest average percent plump at 92.1 percent.

West Region

2-rowed, mixed dryland and irrigated production had the highest average protein value at 11.6 percent.

Central Region

2-rowed mixed primarily dryland and irrigated production, had good quality barley, but no high or low values as compared the other crop reporting regions.

Northeast Region

2-rowed dryland and irrigated production had the lowest average test weight at 46 lb/bu (59.2 kg/hl), the lowest average protein value at 9.7 percent and the highest average plump value at 91 percent.

East Region

Both 2-rowed and 6-rowed irrigated and dryland production had the highest average color score for 2-rowed barley at 4.8, and also had the highest average 1000 kernel weight for 6-rowed barley at 37.7 g.

South Region

2-rowed irrigated production had the lowest average plump values at 84.8 percent and the lowest average test weight value at 48.4 lb/bu (62.3 kg/hl).

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Table 5. Regional Two-rowed Barley Crop Quality

Region	Moisture Content (%)	Test Weight (lb/bu)	Test Weight (kg/hl)	1000 Kernel Weight (g)	Protein Content (%)	Color	Kernel Assortment %Plump	Kernel Assortment %Thin
Northwest	12.8	50.1	64.4	46.3	11.0	3.4	92.1	1.3
West	13.3	49.9	64.2	46.3	11.6	3.2	91.5	1.4
East	12.6	49.3	63.4	46.8	10.6	4.8	89.1	1.7
Central	12.7	49.2	63.4	43.1	10.5	3.0	89.4	0.8
South	11.1	48.4	62.3	42.7	10.0	4.4	84.8	3.2
State Average	12.6	49.6	63.8	45.1	10.8	3.4	90.6	1.5

Table 6. Regional Six-rowed Barley Crop Quality

Region	Moisture Content (%)	Test Weight (lb/bu)	Test Weight (kg/hl)	1000 Kernel Weight (g)	Protein Content (%)	Color	Kernel Assortment %Plump	Kernel Assortment %Thin
East	12.2	47.4	61.1	37.7	11.7	4.0	88.8	1.1
Northeast	13.2	46.0	59.2	34.6	9.7	4.0	91.0	0.6
State Average	12.3	47.3	60.9	36.6	11.3	4.0	88.0	1.3

Table 7. Sound Barley and Skinned and Broken Kernels

State and Crop Reporting District (CRD)**	Sound Barley* (%)	Skinned and Broken Kernels (%)
CRD-2 (Two-Rowed)	100.0	3.1
CRD-3 (Six-Rowed)	99.9	3.0
CRD-3 (Two-Rowed)	100.0	4.7
CRD-5 (Two-Rowed)	99.8	2.0
CRD-8 (Two-Rowed)	100.0	2.5

*Injured-by-frost kernels and injured-by-mold kernels are not considered damaged kernels or considered against sound barley.

** CRD-3 includes Valley, Daniels, Sheridan, Garfield, McCone, Dawson, Richland, Roosevelt and Sheridan counties; CRD-2 includes Phillips, Blaine, Hill, Chouteau, Liberty, Toole, Pondera, Glacier and Teton counties; CRD-5 includes Lewis and Clark, Cascade, Broadwater, Judith Basin, Fergus, Petroleum, Musselshell, Golden Valley, Wheatland and Meagher counties; CRD-8 includes Park, Sweetgrass, Stillwater, Carbon, Yellowstone, Treasure and Big Horn counties